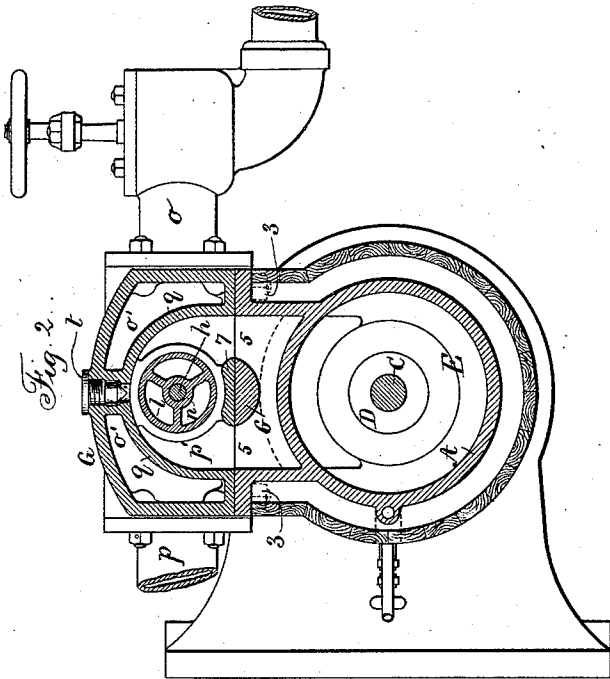
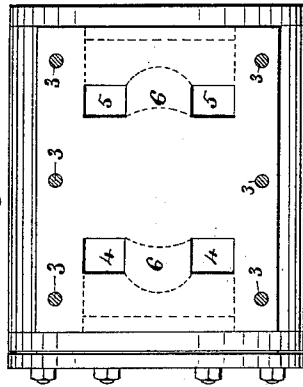
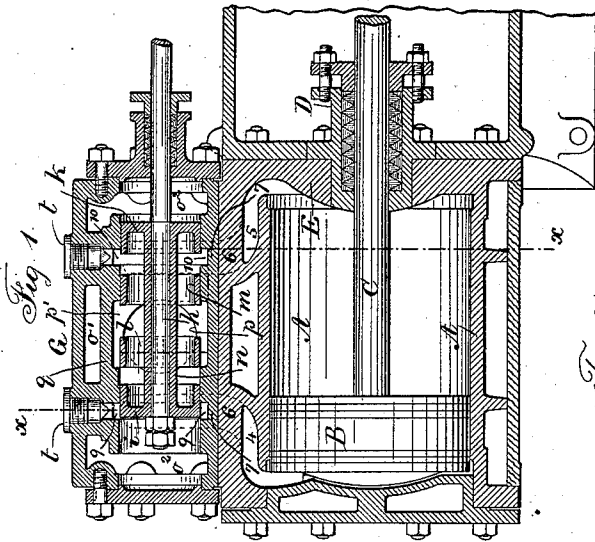


(No Model.)

D. P. DAVIS.  
PISTON VALVE AND CHEST.

No. 306,138.

Patented Oct. 7, 1884.



Witnesses:  
J. Staib  
Chas. N. Smith

Inventor  
David P. Davis  
per Lemuel W. Correll atty

# UNITED STATES PATENT OFFICE.

DAVID P. DAVIS, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO THE NEW YORK SAFETY STEAM POWER COMPANY, OF NEW YORK, N. Y.

## PISTON VALVE AND CHEST.

SPECIFICATION forming part of Letters Patent No. 306,138, dated October 7, 1884.

Application filed April 21, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID P. DAVIS, of Jersey City, in the county of Hudson and State of New Jersey, have invented an Improvement in Piston-Valves and Valve-Chests for Steam-Engines, of which the following is a specification.

Piston-valves have heretofore been used quite extensively in steam-engines; but the rush of the steam in passing through the ordinary port from the cylinder during the exhaust causes more or less unequal pressures on the valve, which results in unequal wear upon the valve and the valve-seats in the chest.

My improvement relates to steam-ports with deflectors applied therein in such a manner that the steam passes in or out at the two opposite sides of the piston-valve, thereby equalizing the action of the steam, and preventing the valve wearing unduly or cutting into its seat. I also provide sight-holes with plugs by which to observe the valves, and to facilitate the adjustment.

In the drawings, Figure 1 is a longitudinal section of the cylinder and valve. Fig. 2 is a cross-section at  $xx$ , and Fig. 3 is a plan of the face of the cylinder.

The cylinder A, piston B, piston-rod C, packing-gland D, and head E are of any usual or desired character. The valve-chest G is a casting, the under side or face of which rests upon the face of the cylinder, and is attached thereto by bolts 3, the surfaces being finished off true and scraped to a steam-tight fit. This valve-chest can be removed and another substituted with facility if the valve or its seat become injured. In the middle of the valve-chest there is a cylindrical opening for the piston-valve, such valve being composed of the stem  $h$ , the two piston-valves  $i$  and  $k$ , and the guide-rings  $l m$  upon arms extending out from the tubular body  $n$ , that connects the valves together. These guide-rings are for the purpose of enlarging the bearing-surfaces, and enabling the valves to pass the ports freely and lessen wear upon the surfaces of the valves. These guide-rings are so proportioned as not to obstruct the free exhaust of the steam. The steam is supplied by the pipe  $o$ , and passes into the chamber  $o'$ , where it nearly surrounds the interior cylindrical case in which the valves

move, and it is admitted to the cylinder at the ends  $o^2$ , and the exhaust-pipe  $p$  opens into the central chamber,  $p'$ ; or this action may be reversed, and the steam admitted at  $p$  and exhaust take place at  $o$ , the valves being modified to suit, and the eccentric properly placed. The arched partition  $q$  separates the chambers  $o'$  and  $p'$ , and the cylindrical part of the chest in which are the piston-valves is made within this arched partition. The ports 4 and 5, that pass from the respective ends of the cylinder to the valve-chest are of the ordinary character, except that there are deflectors or bridges at 6 6, which separate the ports 4 and 5 into two parts, and there are bridges or deflectors 7 7 above the bridges 6, such deflectors 7 being part of the steam-chest. The valve-ports 9 and 10 are in the chest, and they are over the deflectors 6 and 7, and these ports allow the steam to pass in or the exhaust to pass off all around the edges of the valves  $i$  or  $k$  as the same open or close, in the manner usual with piston-valves; but in consequence of the deflectors 6 and 7 the rush of steam is not directly to or from the cylinder, impinging principally in one direction upon the valve, but, on the contrary, such rush of steam is directed by the deflectors, and, being principally at opposite sides and in opposite directions, is equalized to a considerable extent on the valve, and hence the wear is less and more uniform, and less power is consumed in moving the valve. I introduce holes through the top of the steam-chest, opening into the ports 9 and 10, and fit plugs  $t$  into the same, so that when these plugs are removed the valves can be observed. This greatly increases the facility for setting the valves and adjusting the eccentrics to give the proper lead.

I am aware that piston-valves have been made with close valve-moving pistons upon the valve-stem outside the valves. In my case the guide-rings for the piston-valves are necessarily placed between the piston-valves, and they are open to allow the steam to pass freely.

I am also aware that the ports around the piston-valves and within the steam-chest have been made with bridges at intervals that support the packing-rings. In my improvement the ports are entirely open around the valves, and the one deflector in each port simply di-

verts the steam from the valve, causing it to pass at each side of the valve and be balanced in its action.

I claim as my invention—

5 1. The combination, with the steam-cylinder and piston-valves, of a steam-chest having continuous openings around the valve, forming ports connecting with the ports in the steam-cylinder, and a deflector within each port between the cylinder and the piston-valve, to divert the steam from the valve, substantially as and for the purpose set forth.

10 2. The combination, with the piston-valves, of the steam-chest having ports 9 and 10, and 15 openings through the valve-chest in line with

the said ports 9 and 10, and plugs *t*, substantially as set forth.

3. The combination, with the piston-valves and the stem connecting the same, of open rings with arms connecting the rings to the shaft, such rings being between the valves and increasing the bearing-surface, but allowing the steam to pass through such rings, substantially as specified.

Signed by me this 15th day of April, A. D. 25 1884.

DAVID P. DAVIS.

Witnesses:

GEO. T. PINCKNEY,  
WILLIAM G. MOTT.